

# National Weather Service - Elko

## The Great Basin Spotter Newsletter



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### FAST WEATHER FACTS

**Severe Thunderstorm Watch:** Conditions are favorable for the development of severe thunderstorms with large hail and damaging wind.

**Tornado Watch:** Conditions are favorable for the development of severe thunderstorms with possible tornadoes.

**Severe Thunderstorm Warning:** A thunderstorm is producing strong winds of at least 58 mph and/or hail 3/4 inch or larger. The warning can result from either radar indications or public reports.

**Tornado Warning:** A thunderstorm is producing a tornado. The warning can result from either a radar indicated signatures or a spotter report.

### Words From the Meteorologist in Charge by Kevin Baker, MIC

The NWS is about to embark on a new way of forecasting weather. Throughout the history of the agency, we have always relied on text-based forecast products to convey our message to our customers. With the advancement in computer technology, we will now begin the era of forecasting on a grid. This grid forecasting is known as the IFPS (Interactive Forecast Preparation System), and this summer the WFO (Weather Forecast Office) in Elko will begin to use IFPS. By this fall, we hope to derive our zone forecast product text from IFPS forecasts. In addition, we will be generating a limited set of web-based products that will show up on our web site ([www.wrh.noaa.gov/Elko](http://www.wrh.noaa.gov/Elko)). One of the products that may be used is the tabular forecast for a specific location, providing three-hourly temperatures, humidity, wind, and chance of precipitation. This experimental product would be called the revised digital forecast (RDF). Look for additional features in the future that will utilize IFPS technology to better display our forecasts on the Internet. These improvements will expand our service to help protect the Nation's population from weather and water hazards and enhance the National economy.

### Bus Logo Creates a Buzz by Jennifer Stroozas, Intern



*Pictured is WFO Elko's bus logo. From left to right: Kevin Baker, MIC; Sue Packham, ASA; and Vickie Nadolski, Western Region Director*

WFO Elko created a team to come up with ideas to better promote our services and website to our customer base. Sue Packham, WFO Elko's Administrative Support Assistant, came up with the idea of putting our web information and logos on the back of the Elko area's transit system, NEAT (Northeastern Nevada Area Transit) buses. WFO Elko was able to promote our website in an effective and inexpensive manner. Web traffic increased dramatically, especially in times of approaching storms. Our bus logo was featured in Access NOAA and NWS

Focus. Other offices around the U.S. have contacted WFO Elko to get more information to start this method of promotion in their forecast area. By promoting our website to the public, WFO Elko is providing a means for easy and quick access to forecast, watch and warning information.



## Virga by Jennifer Stroozas, Intern



*Virga as seen from the Elko Weather Forecast Office. Note how the precipitation does not extend all the way to the ground. No microburst winds occurred with this particular event.*

Virga is a common meteorological phenomenon in northern Nevada, most frequent in the summer months. Virga is a shower in which the precipitation, either rain or snow, never reaches the ground. This occurs because the lower part of the atmosphere into which it falls is extremely dry. The precipitation will evaporate in this layer and dissipate before it can reach the ground. Such showers may look benign, but they are sometimes associated with strong and gusty winds at the surface known as microburst winds. The evaporation that takes place in this elevated and initially dry layer of air helps induce downdrafts. In the right meteorological conditions, such downdrafts can be accelerated to the ground as a microburst. Not all virga occurrences result in microburst situations. Once enough virga has fallen in the dry layer and sufficient evaporation has taken place to saturate it, the precipitation will fall to the ground.

At that point, it is referred to as a shower of either rain or snow, and it is no longer referred to as virga.

## The Quality Shows— at WFO Elko by Zaaron Allen, Lead Forecaster

Since the beginning of the new millennium, the NWS has increased the emphasis of customer service, with a major concentration on product quality and consistency. Nowhere is this more true than at WFO Elko. Every product that is issued goes through a rigorous quality check by a minimum of two forecasters. This has resulted in a dramatic reduction in the number of errors, both in the writing of the forecasts (less typographical errors and bad grammar) and in forecast consistency (the narrative portion of the forecast matches the spot forecasts). Another important portion of quality control comes in the form of feedback from our customers. Whether you receive our products from NOAA Weather Radio, our website, or another media source, we would love to hear from you. If you come across an error in any of our products, please call us at 778-6716, and we will do whatever it takes to make the product right!

## What's New in Science? by Steven L. Apfel, SOO

On May 14-16, I attended the annual National Weather Service Western Region conference at the new NOAA building in Boulder, Colorado. The conference was attended by 24 Science and Operations Officers (SOO) and 3 Developmental Operations Hydrologists (DOH). The main theme for this year's conference was preparation for the new digital gridded forecast system known as IFPS. Several key scientists presented material on IFPS as well as demonstrations and lab exercises.

The focus beyond IFPS centered around training methods to bring new science and technology to the operational staff. One of these methods is the use of the Weather Event Simulator (WES) computer to archive weather events and run case studies in near real-time. The WES has already shown valuable improvements in forecast experience with the staff and will be a valuable training tool in the future.

The remaining time in the conference was spent looking at new improvements to the weather forecast models and outlining the future goals of the National Weather Service for science, technology and training. The research efforts here in the Elko forecast office this year will center around better understanding of critical fire weather patterns, evaluation of thunderstorms over the Great Basin, and continued training with the new IFPS system.

## Lightning Safety by Paul Eyssautier, WCM

The week of April 29 through May 4<sup>th</sup> was declared National Lightning Awareness Week. The National Weather Service Forecast Office in Elko released daily bulletins on lightning safety and the science of thunderstorms and lightning. Portions of these bulletins were broadcast over the NOAA Weather Radio.

Lightning is a very dangerous threat. An average of 73 people are killed in the United States each year by lightning, and 300 people are injured. Lightning can strike miles from a thunderstorm, so always be careful whenever you hear thunder. Seek a sturdy shelter and stay away from exterior windows, electrical appliances, telephones, and plumbing fixtures. Lightning can travel great distances under the proper conditions. If outdoors, stay away from bodies of water, and make sure you are not the highest point in the surrounding area. If caught outdoors with no shelter available, crouch down on the balls of your feet to make yourself as small a target as possible.

The sound of thunder travels at a speed of 1100 feet per second, or about 1 mile in 5 seconds. The five second rule is an easy way of determining the distance from a thunderstorm. When you see lightning, count the seconds until you hear thunder. Divide this number by 5, and you will get the approximate distance in miles from the thunderstorm.

## WFO Elko's Doppler Radar By Bob Hoenisch, Intern/WSR-88D Focal Point

The National Weather Service forecast office in Elko operates a Doppler Weather Surveillance Radar (WSR-88D) to track storms of all varieties as they pass through northern Nevada. The radar is located on Sheep Creek Mountain, north of Battle Mountain. This location was picked because it is central in our forecast area and gives us the widest coverage of radar data possible.

Doppler Radar is a very important tool to meteorologists because it can help detect severe weather events that threaten life and property. This includes the intensity of thunderstorms, probability of hail, damaging winds, and rainfall amounts. Such information helps National Weather Service forecasters issue advanced warnings on events such as severe thunderstorms, tornadoes, flash floods and heavy snowfall. Using Doppler technology, the WSR-88D calculates the speed and direction of winds in relation to the radar. By providing data on the wind patterns within developing storms, WSR-88D can identify the conditions leading to severe weather such as tornadoes, and can help in tracking the direction and speed of tornadoes once they form. While tornadoes are not common in the Great Basin, they do occur. Other severe weather in the form of flash floods, strong thunderstorm winds and hail occur nearly every season northern Nevada.

As thunderstorms become more frequent in the Great Basin this summer season, you may find it interesting to track storms from your home computer using the radar images found on the Elko NWS website, [www.wrh.noaa.gov/Elko](http://www.wrh.noaa.gov/Elko). You may notice that the color palette to the radar images are not always the same. When the radar is in precipitation detection mode, the color scheme ranges from light blue through green, yellow and red. Generally, the brighter colors in this mode show where more intense precipitation is falling. When no precipitation is falling, the radar will be in clear air mode. This color palette is composed mostly of yellow and red. In this mode, the radar is highly sensitive and detects airborne particles in the atmosphere including dust and virga. You may also notice gaps or wedges of missing data. This is a result of the radar beam being blocked by some of the mountains within the radar's range.



*WSR-88D radar just north of Battle Mountain on Sheep Creek Mountain. The tracking antenna is housed inside the dome.*



## Web Notes by Brian Olsen, SCEP/Co-Webmaster



WFO Elko's new website design.

The last six months have been very exciting in cyberspace for WFO Elko. All of Western Region changed the look of their websites. This action was part of a nationwide web standardization project that will eventually encompass the entire National Weather Service and additional branches in order to better service to the public. By adopting a common appearance, the public will more easily find the information they are looking for. The public will know where to find satellite, radar, and watch/warning information on any NWS website because they will all look similar. The new format includes a common banner across the top of each page and a left-hand menu. Additionally, offices have an interactive watch/warning map which lists any active watches, warnings, and statements.

For the Elko office, this was the second website change. On January 1, 2002, the first attempt at a new web design was implemented. It featured an interactive left-hand menu in which a sub-menu popped up as the mouse scrolled over each major topic. There was also a central interface window in the middle of the page in which the user could display various graphics selected from another system of interactive cascading menus across the top of the window. The new design was very modern and highly advanced, but home web browsers were having difficulty loading the pages due to the elaborate menu system. It was decided, therefore, to scale back and design a page that would load faster but still provide convenience to the public. The result is our homepage today. The 'home' button in the banner is the only item that still retains a pop-up menu. Pages now load much faster than before, and user feedback has been positive.

On Elko's website, we are striving to convert all sub-pages to the new look, resulting in a uniform appearance for the entire site. During the site conversion, we will take the opportunity to better organize our pages. Some will be renamed, others moved, and others removed entirely. As a service to our users, a log of changes can be found at <http://www.wrh.noaa.gov/Elko/webchanges.html>. A link to this page can also be found under the "Local News" items on our homepage.

## Flood Season is Here! By Zaaron Allen, Lead Forecaster

### *Are you prepared?*

Summer is arriving soon, and that brings the threat of heavy rainfall capable of producing flooding. Almost all of the major flood events across the Great Basin come during the summer months when slow moving thunderstorms produce locally intense rainfall in a very short period of time. The following information will give you tips on how to prepare in advance for a flooding event, safety tips during a flooding situation, and what to do after the event has ended.

### *How do flash floods occur?*

Several factors contribute to flash flooding. Key elements are the rate of rainfall, topography, and duration. Soil conditions and ground cover also play a role. Flash floods occur within a few minutes or hours of excessive rainfall, a dam or levee failure, or a sudden release of water held by an ice jam. Flash floods can roll boulders, tear out trees, and destroy buildings and bridges.

### *Useful websites for further information on Flood Safety and Preparedness:*

- National Weather Service - Flash Floods and Floods - The Awesome Power!:

<http://www.nws.noaa.gov/om/brochures/ffbro.htm>

- American Red Cross:

<http://www.redcross.org/services/disaster/keepsafe/readyflood.html>

## Earth Day Activities by Paul Eyssautier, WCM

On April 22nd, WFO Elko was invited to participate in Earth Day Activities sponsored by the Elko Band Council of the Te-Moak Tribe of the Western Shoshone. Alfreida Jake, chairperson of the Environmental Department of the Elko Band, organized this event primarily for the school age children. About 45 students and their parents attended the festivities. I provided a weather presentation, consisting of a demonstration of the affects of unequal pressure on a soda can, how to produce a tornado with your vacuum cleaner and some dry ice, as well as weather safety hints and information on the products and services of the National Weather Service. The weather presentation was halted at opportune times to raffle approximately 30 bushes, plants, small trees, and bowls of fish. The students and parents also had a chance to enjoy a bowl of nachos and drinks while participating in these activities.

## Supercell Thunderstorms in Northern NV by Jim Wallmann, Forecaster

When most people think of supercell thunderstorms, the first thought that comes to mind is generally large storms producing tornadoes in the Great Plains. Although supercell thunderstorms are most often observed in the Plains, they can occur anywhere in the United States. One example occurred in northern Nevada on July 5<sup>th</sup>, 2001, when three supercell thunderstorms rumbled across northern Elko County.

### Supercell Characteristics and Large-scale Environment

Supercells are characterized by a strong, rotating updraft. An updraft is the rising air column in a thunderstorm, and when the updraft begins to rotate, it is called a mesocyclone. (Think of a low pressure area except on a much smaller scale of 1-2 miles.)

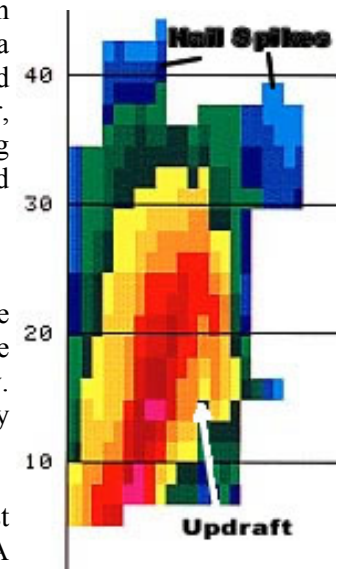
Supercells will often form in environments of strong wind shear and strong atmospheric instability. Wind shear is the change of wind direction and/or speed with height. Although thunderstorms in northern Nevada often form when little wind shear is present, July 5<sup>th</sup> was a different story. On this day, 60 mph southwest winds at a height of 30,000 feet combined with near calm conditions at the surface to create an environment of significant wind shear, favorable for supercell thunderstorm formation. These supercells produced hail and strong straight line winds as the rotating portion of the storms remained 10,000 feet above ground level.

### Storm History

The first supercell formed in northeast Humboldt County at around 2:30 pm, just east of the Santa Rosa Mountain Range. This storm then moved slowly eastward into the Owyhee Desert and passed a nearby remote weather station normally used by the fire community. This location reported a wind gust to 67 mph as the storm passed. This supercell then slowly weakened as it headed into Idaho.

The next storm, and possibly the strongest storm, formed just to the southeast of the first storm at 4 pm near Wilson Reservoir. As the storm tracked northeast, it became stronger. A severe thunderstorm warning was issued for this storm as it beared down on Mountain City. Twenty minutes later, a report was received from a storm spotter in Mountain City of hail larger than quarters (1") at approximately 5:15 pm. A cross-section of this storm as seen by radar is shown in the adjacent figure.

The third supercell formed shortly after this report southeast of the Jarbidge Mountains. This storm headed for Jackpot and passed just to the southeast of town as it moved into Idaho. Although not under the center of the storm, a spotter reported 3/4" hail.



*A radar image of a cross-section of one of the storms that moved through northern Nevada on July 5, 2001.*

## Be a Severe Weather Spotter by Paul Eyssautier, WCM

The National Weather Service Forecast Office in Elko is looking for volunteers to serve as Severe Weather Spotters. Severe Weather Spotters serve their community, as well as the National Weather Service, by providing vital information that helps us warn the communities of Northern and East Central Nevada of approaching dangerous storms. A call from a Severe Weather Spotter could save a life.

Many of you already volunteer as Severe Weather Spotters. Perhaps you know of a friend or neighbor that would also like to volunteer. They can contact us through our website. Click on Spotter Program under Weather Safety located in the left-hand table. You can also call us at 775-778-6716, or e-mail me, Paul Eyssautier/Warning Coordination Meteorologist at [Paul.Eyssautier@noaa.gov](mailto:Paul.Eyssautier@noaa.gov). We will provide all the necessary training materials for Severe Weather Spotters. We can also visit your community and present a workshop on "Weather Safety and Severe Weather Spotter Training." Just give us a call.

## Stay Tuned to Your NOAA Weather Radio! by Jennifer Stroozas, Intern

Starting June 1, you will be hearing new voices over your NOAA weather radio. The National Weather Service is in the process of upgrading the current computer-generated voice with new, more realistic ones. WFO Elko will begin broadcasts with a new female voice, Donna, and a new male voice, Craig. We will be closely monitoring broadcasts with the new voices since we have the ability to adjust word pronunciations as necessary. Each voice will be incorporated by reading different weather products broadcasted over the radio. To hear samples of what the new voices sound like, check out [www.nws.noaa.gov/nwr/newvoice.htm](http://www.nws.noaa.gov/nwr/newvoice.htm). We welcome your feedback on the change!

## Ely, Nevada by Doug Cain, Lead Forecaster

Ely is located near the southern rim of the Great Basin. At 6252 feet, Ely is one of the highest cities in Nevada, and the center of commerce for White Pine County. While most of the valleys are covered in sagebrush, there are white pine trees in the higher elevations. Explorers first traveled through the region in the 1820s with a number of Pony Express stops being established across the area. Mining exploration first began in White Pine County in the 1860s and intensified in the 1880s. The White Pine County Courthouse in Hamilton burned in 1885, and as a result, the state legislature moved the county seat to Ely in 1887. As for Ely's climatological data, normal precipitation is 10.13 inches per year with an average snowfall of 53.3 inches. Snowfall totals over the last 30 years have been as high as 71.1 inches during the 1982/83 winter. The record high temperature for Ely is 100 degrees F set in July 1985, with a record low of -30 degrees F in February 1989. The average first freeze is September 6, with the last freeze being June 16.

WFO Elko takes every opportunity possible to participate with the Ely community. Early in the year, NWS representatives participated in a career fair at White Pine High School. Recently, staff members had the opportunity to visit with some of the local media in Ely, and gave weather presentations at David E. Norman Elementary. Look for our booth at the County Fair this summer!



*Photo of the White Pine County Courthouse.*